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WILDERNESS ADMINISTRATION

What Is Management Buying For Its Dollar?

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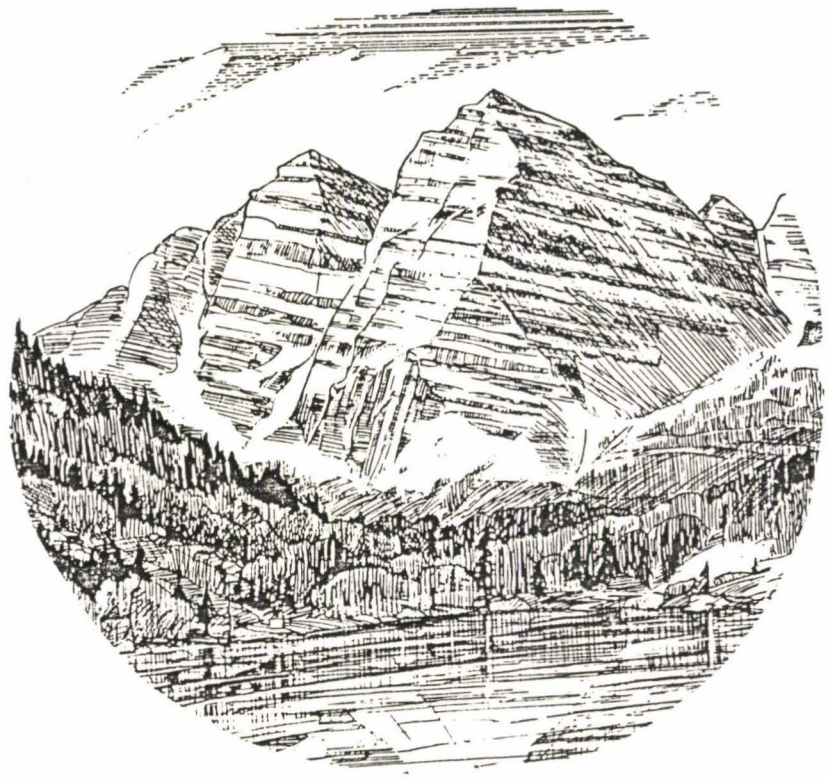
ABSTRACT

This paper examines the effectiveness of wilderness funding. It shows how various levels of wilderness funding affect physical and social resource conditions and incrementally affect the baseline administration program in the Maroon Bells-Snowmass Wilderness in Colorado.

The importance of identifying baseline management programs that meet the legal requirements of the 1964 Wilderness Act through the establishment and analysis of physical and social resource objectives is also stressed. Acceptable levels of change in social and biological conditions must be defined and monitored on a wilderness by wilderness basis before management can determine what funds it needs to allocate or what management is buying for its dollar.

INTRODUCTION



CHAPTER 1

Chapter I

Introduction

Through Congressional action in the form of the Wilderness Act of 1964 the people of the United States have been assured that a portion of the Country will remain unspoiled for future generations. But it is yet unknown what the final achievement of wilderness preservation will be. No matter how much more land is eventually classified as wilderness, land management agencies will be increasingly faced with the greatest challenge: wilderness management - formulation and implementation of management programs to achieve the objectives of the National Wilderness Preservation System. The case for assigning a high priority to wilderness management has been stated in the following way...

> In the controversy surrounding wilderness allocation, equally important questions about wilderness management are being slighted ... simply allocating an area as wilderness does not assure its preservation.
>
> Enlightened wilderness management is also needed.
>
> Most of the areas to be set aside as wilderness will be staked out within the next few decades. From then on, the fate of those areas will rest solely upon their management. This is a sobering responsibility for resource professionals, and future generations will be our critics.
>
> Resource professionals are challenged to develop effective approaches to wilderness management now - while there is still time to develop management policies and strategies by design - rather than wait until problems are racing out of control and our efforts can, at best be reactions to pressing needs (Hendee 1974).

Wilderness management is essentially the management of human use and influence to preserve naturalness and solitude. It includes everything the person responsible for a wilderness does in administering the area; for example, the formulation of goals and objectives for individual areas and all policies, standards, and field actions to achieve them. Specifically, management includes the planning and implementation of such things as rules and regulations for controlling overuse; facilities such as trails and signs; decisions on access roads to the wilderness boundary; wilderness patrol; and public education, including information provided in maps, brochures, and guidebooks.

Management has become and will continue to become more and more important due to the overwhelming change in the numbers of users. At least 20 times as many people visit wilderness now as in the 1930's. There is a real danger of people loving wilderness to death.

Legal Responsibilities of Wilderness Management

Although Wilderness Management includes more than managing just recreation use (i.e. scenic, scientific, educational, conservation, range, minerals, fire, water, and historical uses), traditionally Forest Service management and funds have been concentrated on control of recreation use and backcountry clean-up.

FSM 2320 indicates that "the presence of large numbers of people in any area, even though they may cause little or no damage to the soil, vegetation, water, or wildlife, erode and may eventually remove the wilderness resource from the land". It also says "public use will be administered to insure that the wilderness resource is maintained". FSM 2320.4 further states: Each wilderness manager has the following responsibilities:

1. Ensuring that the wilderness is managed consistently, in a manner which is legally and administratively unimpeachable, and with the intent of retaining an enduring resource of wilderness.

2. Protecting wilderness from a proliferation of improvements and ensuring removal of existing improvements not essential to protection of the wilderness resource or use for livestock grazing operations.

3. Balancing use of the wilderness with maintenance of the wilderness resource.

These are tremendous responsibilities and charges considering today's shrinking budgets for wilderness management.

In addition, the general absence of wilderness management plans which would further define these responsibilities create another obstacle. In discussing what management is buying for its dollar, it is important to realize that uses and values vary between the National Forest wildernesses and frequently vary among different parts of an individual wilderness. There also may be wide differences in terrain and other geographic characteristics, climate, vegetation, and wildlife. Historical patterns of use, local customs, and the traditional attitudes of visitors and interested non visitors also differ between and within wildernesses. Consequently, activities that are accepted and management practices that are necessary and appropriate on one wilderness may be either unnecessary or unacceptable on others. Before one can accurately assess what management is buying for its dollar, specific management objectives, requirements, decisions implementing administrative

practices and visitor activities in individual wildernesses must be developed and described.

Problem Analysis - In order to better define the problems wilderness managers will be facing in the future and to "zero in" on what management is buying for its dollar, the following distinctions are helpful:

- Wilderness budgets are decreasing due to national de-emphasis on nonrevenue, noncommodity producing activities. In this era of increased attention and emphasis on cost effective management and managing those resources which provide the best dollar return to the treasury, wilderness management is taking a back seat.

  On the other hand, wilderness use (and resulting impacts) will occur whether management allocates funds for administration or not.

- Resource management funding will be ever increasingly obtained on a value per unit of output basis when possible. Wilderness outputs and values have not yet been well quantified.

- Most other Forest Service programs, such as timber and range, have well defined base level programs and financing identified to administer the on-going program necessary to provide at least a minimum level of resource management and protection to meet legal obligations. No base line program for wilderness administration is apparent. Wilderness funds are most often cut first since it is not apparent to management what is being foregone.

- Condition inventories and resource monitoring systems for wilderness have not been developed and/or utilized to the extent they have in the Range and Timber functions. Long term Wilderness resource loss is therefore difficult to demonstrate. Managers tend to recognize only short term losses.

- It is difficult to measure the loss of the more subjective values of wilderness such as spiritual refreshment which may be lost due to management's lack of emphasis on administration. Conversely, public use for recreation purposes is usually one of the greatest demands placed on wilderness and man's social and physical impact can be identified and measured.

- Man's use (camping next to lakes, streams and trails) may be affected by management techniques such as NORM (Natural Opportunities for Recreation Movement), permit systems, wilderness patrol, signing, visitor information and education. All techniques require some level of Forest Service physical presence for success.

Statement of the Problem

Management needs to better define and fund a base line program for Wilderness Administration which meets minimum legal obligations and recognizes long term losses or gains in the wilderness resource.

Objective

This paper will determine by example and literature search the effectiveness of wilderness funding and how it affects physical and social resource conditions and incrementally affects the base line administration program in the Maroon Bells-Snowmass Wilderness.

Limitations

The amount of use particular campsites and areas within the Maroon Bells-Snowmass Wilderness is estimated by figures obtained from past wilderness guards and trail counter extrapolation. Use figures were collected at level four R.I.M. accuracy standards.

Frissell class condition of campsites have not been formally measured. Code-a-site inventories have been made, but have not recently been reread. Photo points are available, but current photos need to be taken before valid comparisons can be made.

No field research could be completed due to the timing of the Clemson Course and the due date of this project. Data and supportive information had to be obtained through research of existing files and sources.

Only existing conditions on campsites that receive different amounts of use could be compared. This approach has the drawback of assuming that all sites were originally identical and, therefore, that differences in the existing conditions on lightly and heavily used campsites reflect differences in the amount of change which has occurred, rather than differences in original conditions.

REVIEW OF LITERATURE

CHAPTER 2

Chapter II

Review of Literature

Determining what management is buying for its dollar spent on wilderness administration involves a literature review of such topics as economics of wilderness, costs of wilderness, measurement of recreation impacts on wilderness, management problems in wilderness, recreation planning, and wilderness capacity determination. Following is a summary and brief review of literature pertinent to the objective of this paper.

Wilderness Carrying Capacity and Acceptable Level of Change

FSM 2320 recognizes that wildernesses have a capacity to absorb man's impact from recreation. It states, "Public uses will be administered to insure that the wilderness resource is maintained". It goes further in stating that "the presence of large numbers of people in any area even though they may cause little or no damage to the soil, vegetation, water, or wildlife, erode and may eventually remove the wilderness resource from the land". FSM 2320 also recognizes "activities that are accepted and management practices that are necessary and appropriate on one wilderness may be either unnecessary or unacceptable on others".

Specific management objectives, requirements, and decisions implementing administrative practices and visitor activities in individual wildernesses need to be developed and described. Wilderness capacity and acceptable level of change must be determined on a wilderness by wilderness basis through appropriate analysis and wilderness planning.

Man's recreational impact is already evident in most wilderness areas. Frissell has developed an inventory system that visually recognizes patterns of campsite change that even the novice wilderness ranger or patrolman can use with minimal training and no specialized equipment or research.

In Cole's Wilderness Campsite Impacts: Effect of Amount of Use, he states that Frissell's condition class rating is the best single indicator of campsite condition. He says it doesn't identify soil changes very well, but does provide a good indication of overall impacts, as well as those changes that use management can influence -- bare ground and duff depth, in particular.

In that same study Cole points out several other factors important in determining the impact of management's dollar on wilderness administration:

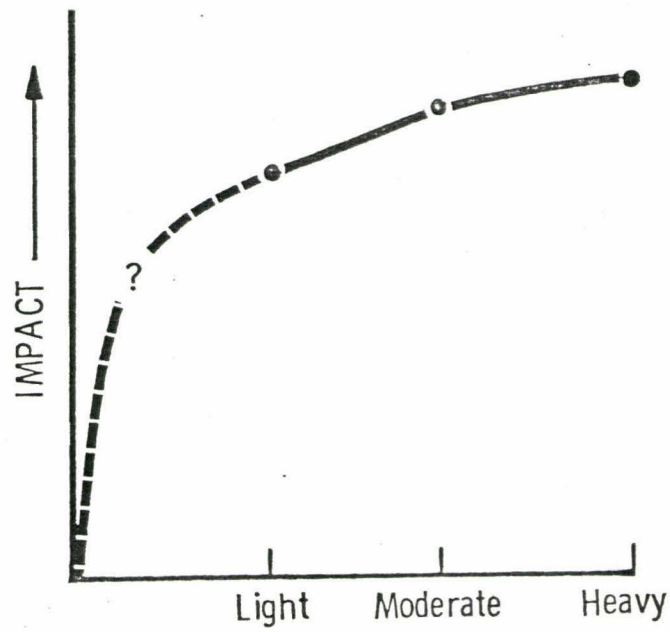
- Most site impacts do not appear to sharply reduce site desirability. Most evidence suggests that visitors seldom notice or are bothered by impacts on campsites (Lucas 1979).

- Of the changes found on campsites, the impact most likely to decrease the future desirability of the campsites in the loss of seedlings and saplings which may forecast the eventual reforestation of campsites.

- Maintenance of native understory populations, except on protected sites, is realistically impossible because trampling cannot be eliminated.

- The impact most likely to reduce the functional ability of a campsite is long-term erosion ... tree root exposure should provide some indication of the amount of erosion which has occurred on a site. Informal observations suggest that severe soil erosion is rare because campsites are usually flat and because compaction reduces the detachability of soil particles, inhibiting erosion by surface runoff.

- On the campsites studied, even a few nights of use per year are usually "too much", because this use causes most of the change which is likely to occur on a campsite. The following graph indicates this relationship:



AMOUNT OF USE

Typical research results for the relationship between campsite impact variables and amount of use. The response of variables as use increases from no use to light use is poorly understood. (Cole 1982)

- The variables which do show meaningful differences related to amount of use are bare ground, bare area, duff depth, and trees with exposed roots.

- While dispersal may decrease campsite use and visitor encounter frequencies in areas of heavy use, it can also increase the number of areas where one can expect to encounter other parties, and the number of areas which show the effects of recreational use. This reduces the proportion of the wilderness that offers opportunities for solitude and shows no substantial evidence of human impact.

- Observations suggest that most of the light-use sites are used less than five nights per year, with some of them receiving no use during some years. Most moderate use sites probably are used 10 to 20 nights per year, while most heavy-use sites are used 25 to 50 nights per year.

  (While the amount of use each site receives had to be estimated, it is the investigator's opinion the same criteria can be used for the Maroon Bells-Snowmass Wilderness Area.)

- Experimental trampling studies have found that trampling impact usually varies more between vegetative types than between use levels (Nagy and Scotter 1974).

- Although there is a popular belief that timberline meadows are unusually fragile, studies have consistently shown the relative resistance of Carex nigricans (black alpine sedge) meadows. These meadows are susceptible to impact during early summer snowmelt, but by the time they dry enough to be usable, they are extremely durable sites.

- More vegetation change had occurred on forested sites, regardless of elevation, than on open grassland or meadow sites (Cole 1981a.)

Lucas (1980) said that sustained, rapid growth in the recreational use of wilderness lands threatens the preservation of both naturalness and solitude. Many, if not most, areas have locations where impacts on soil and vegetation are severe and where visitors sometimes are crowded beyond any possible definition of solitude. Visitor management is increasingly essential in this situation.

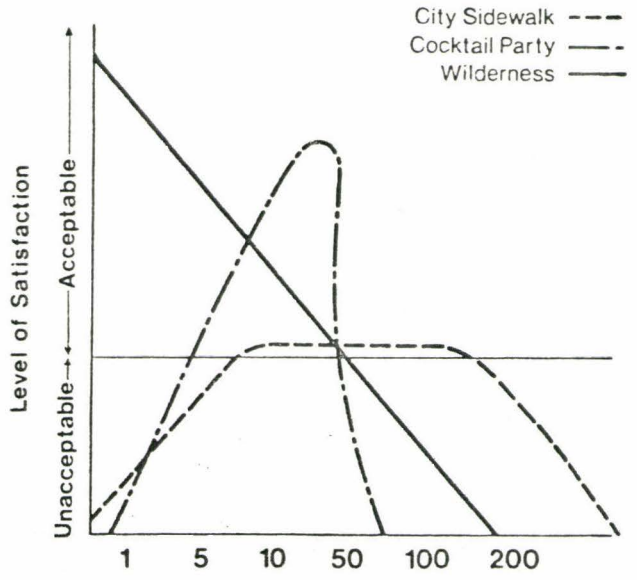
He also stresses that the main approach to handle growing use pressures must be through management of use, including such things as modifying numbers of visits, lengths of stay, timing of use, geographical distribution of use, party size, method of travel, activities, and visitor behavior (Lucas 1973).

Lucas determined by interview of users that the most common user complaints about changes in wilderness area conditions were more crowding and more worn and littered areas. This reinforces the conclusion that use in relation to capacity is a justified concern.

There is also a psychological carrying capacity. Since wilderness is very much a state of mind, this factor perhaps is the most crucial of all in preserving the experience of wilderness (Nash, Roderick 1978).

As an aid to understanding psychological carrying capacity, consider the following satisfaction curves for three kinds of activity:

THE PSYCHOLOGICAL CARRYING CAPACITY CONCEPT



In their research in support of the Maroon Bells-Snowmass Wilderness Plan, Driver and Haas collected data by interview that strongly supports this factor of capacity and level of acceptable use.

According to Wagar (1968) carrying capacity is a relative term. It is not an absolute, inherent number that lies waiting for discovery by managers and researchers (Wager 1968). Its range depends upon specific objectives that are established for an area. Capacity must be established by managerial judgement - there is no magic yardstick to tell when it has been exceeded. It is tied to the quality of the physical-biological environment and the human experience offered by wilderness.

Regulations implementing the 1976 National Forest Management Act (NFMA) specified that planning for each national forest wilderness would:

> Provide for limiting and distributing visitor use of specific portions in accord with periodic estimates of the maximum levels of use that allow processes to operate freely and that do not impair the values for which wildernesses were created (Federal Register 1979).

Wilderness Administration Emphasis

Most researchers agree that without proper management, the allocation of wilderness could well be meaningless. Also implicit is the idea that it is not the wilderness as much as the wilderness user who needs management. This principle is the basis of NORM (Natural Opportunities for Recreation Movement) (Greg 1983) and various use allocation techniques being developed.

Another common theme in research has been the fact that acreage allocated to wilderness is finite. The closer we are to adding no more wilderness acreage, the more important management of what we have becomes.

Managers should anticipate that wilderness emphasis will need to increase in order to meet the increasing demands on wilderness and to meet their obligations by law. Per FSM 2320, each wilderness manager has the following responsibilities and objectives:

Responsibilities -

1. Ensuring that the wilderness is managed consistently in a manner which is legally and administratively unimpeachable, and with the intent of retaining an enduring resource of wilderness.

2. Protecting wilderness from a proliferation of improvements and ensuring removal of existing improvements not essential to protection of the wilderness resource or use for livestock grazing operations.

3. Balancing use of the wilderness with maintenance of the wilderness resource.

Objectives -

1. Maintain an enduring system of high-quality wilderness.

2. Perpetuate the wilderness resource

3. Provide, to the extent consistent with items 1 and 2, opportunities for public use, enjoyment, and understanding of wilderness, and the unique experiences dependent upon a wilderness setting.

4. Maintain plants and animals indigenous to the area.

5. Accommodate and administer those uses or activities which are of the type generally prohibited by the Wilderness Act, but which are specifically excepted by that act, or subsequent establishing legislation, in such manner as to minimize their impact on the wilderness resource and values.

6. Maintain stable watersheds within constraints of the Wilderness Act.

7. Consider protection needs for populations of threatened or endangered species and their habitats in management of wilderness.

According to the publication, Wilderness Management (Hendee, Stankey and Lucas 1978), managing wilderness is a new idea. It has really only became an issue in the last 10-20 years. "Draw a line around it and leave it alone", pretty well describes the prevailing philosophy not so long ago. Even today, this approach is shared by some. But most have concluded that ignoring management just won't work with today's pressures descending on wilderness.

According to Zivnusha (1973) and Simmons (1966), classification as wilderness assures only that development will not occur; it does not create "new" wilderness or add capacity. The land was always there, and it was being used before it was classified. In order to gain the illusion of adding wilderness (i.e. the advantages that would accrue if new wilderness could be created), there is only one option: better management and protection of remaining wilderness.

In her paper, Trends In Recreation Use of National Forest Wilderness (1981), Margaret Petersen indicated that the change in total use of National Forest wilderness from 1965 through 1980 is due primarily to increases in use intensity on the original areas existing in 1965. Not until 1978 were the first substantial increases due to the increasing wilderness land base evident. Even so, 88% of the total visitor day use in 1980 occurred on the 1964 areas that comprised only 65% of the total National Forest wilderness acreage.

Over all in Colorado, recreation use of Forest Service administered wilderness areas has grown at an average annual rate of 9.2% during the previous decade (Walsh, Gillman and Loomis 1981).

Is there an alternative to managing a wilderness? Two policies - both unacceptable - could avoid the necessity to manage. First, all use could be prohibited. Some problems, like fire control, would still require some effort, but essentially no use would make no management a possibility. But, the Widerness Act and wilderness philosophy make it clear that wilderness is for the use and enjoyment of people. Second, a completely laissez-faire attitude could eliminate the need for all management and planning. Just classify areas and forget about them. Any kind of use not clearly illegal under the Wilderness Act could be allowed in unlimited amount, and environmental damage or changes in the ecosystem would simply be accepted. If either alternative were selected, wilderness would vanish from most places (Frome 1974). This would be a violation of the Wilderness Acts which require the protection and perpetuation of wilderness.

The middle ground between these two extremes -- no use allowed and classify-and-forget -- requires management.

Wilderness Economics

Most research on this topic has centered around costs of wilderness allocation and the cost side of the benefit-cost ratio. Most agree that the total cost of supplying wilderness consists of (1) Increases in nonwilderness management costs as productivity on nonwilderness sites is increased to meet commodity constraints, (2) Increases in values of products and services given up as a consequence of increasing wilderness size, (3) the administrative costs of managing a wilderness area (Campbell and Countryman 1981).

This paper will concentrate on the administrative costs only and will assume opportunity costs and wilderness establishment costs have already been foregone.

Research also points out information gaps on the output side of the benefit cost equation. Driver and Rosenthal suggest:

1. Measures of program outputs should be tied to the Recreation Opportunity Spectrum system, where applicable.

2. More research should be done to refine methods for quantifying economic demands, output quality and program benefits.

3. Better systems are needed to measure total program costs, costs of specific program elements, and costs of specific types of opportunities.

They further state that little objective documentation of the benefits of resource preservation is available.

Davis (1963) says that without information on the consumer's willingness to pay, there can be no benefit analysis of public expenditures on outdoor recreation. Dwyer and Bowes (1979) say that two general methods are presently available for developing models to estimate the willingness of users to pay for recreation: (1) the travel-cost approach for estimating regional demand, and (2) the survey-based method. They conclude that if there is a choice of methods the travel-cost method is preferable since it is based on what people do, rather than what they say they will do.

Walsh, Gillman and Loomis (1981) said statistical analysis suggests that future growth in income, increased education levels, and changes in the age characteristics of the population will increase willingness to pay for recreation use of wilderness.

At Clemson two papers were presented which did an excellent job of explaining benefit-cost analysis. One was from Brown and Dane's, Analytical Methods and Computer Applications in USFS Planning and Decision-Making (1974). The other was from a textbook (author unknown), Chapter XII, Benefit-Cost Analysis In Natural Resource Policy. Both articles stressed that the Forest Service has two relatively unique problems in dealing with benefit-cost analysis.

- First, the decision horizon (the difference in time between realization of the consequences of a decision and the time at which the decision must be implemented) is usually greater for Forest Service decision problems than it is for decision problems facing the private sector. Whenever the decision horizon is increased, one can expect a corresponding increase in the degree of uncertainty associated with evaluation of predicted outcomes (Author Unknown 1982).

- Second, revenue received by the government as a consequence of allocated resources to a United States Forest Service project is usually an unreliable indicator of the worth of that project. Forest Service personnel cannot rely on the economic marketplace to establish a value on the resources they provide. Nevertheless, the name of the game in today's society is "accountability." The public wants to know what benefits they are to receive as a consequence of allocating resources to the USFS (Brown and Dane 1974).

This is especially true for wilderness benefit-cost analysis. Research is limited on the topics of value of wilderness. In Dorfman's Measuring Benefits of Government Investments (1963), it was determined that the value of a recreation day was .30 per hour or $2-$3 per day.

In Stankey's Myths in Wilderness Decision-Making (1971), he said studies suggest that cost per person day associated with wilderness recreation appear to be comparable or lower than those associated with other outdoor recreation activities. In 1962, he indicates that value per person day averaged $3.

Obviously much has changed since the wilderness value estimates of the 1960's. If nothing else, demand for wilderness has increased and people are spending more and more on sophisticated equipment.

Wilderness is very important to Pitkin County and the Town of Aspen. In a statement before the Colorado Air Quality Commission in August 1982 Mark Fuller, Pitkin County Environmental Coordinator, said that the Maroon Bells-Snowmass Wilderness represents an important introduction to the back country for many tourists. He said that these visitors represent well over 2.6 million dollars in revenue (adjusted for inflation) to the area's summer economy. He extrapolated this information from Goeldner's, Aspen Summer Visitor (1975) and Forrester's, 1981 Pitkin County Almanac.

Walsh, Gillman and Loomis (1981) concluded in their report entitled "Wilderness Resource Economics: Recreation Use and Preservation Values", that the consumer surplus measure of benefit from recreation use of Colorado wilderness is approximately $14 per visitor day.

The White River Forest Plan uses $8 per Recreation Visitor Day for the value of wilderness. This is the same as Region 2's RPA value for a wilderness visit. This value is figured at first quarter 1978 dollars.

The analysis in this paper will be done in first quarter, 1982 dollars which equals $11.11. Due to high recreation demand and the destination type of user in the Maroon Bells- Snowmass Wilderness, it could be effectively argued that the value for this particular wilderness is even higher. However for the comparative purpose of this paper, $11.11 is sufficient.

The Forest Plan also utilizes both a 4 percent and 7 1/8 percent discount rate over a 50 year time frame in figuring Benefit-cost analysis. Once again, due to lack of more precise figures, these values are acceptable for use in benefit-cost alternative comparisons in this paper.

The Clemson papers (Brown and Dane 1974 and Author Unknown 1982) made additional points concerning benefit-cost analysis which are summarized below. This summary is important for better understanding of benefit-cost analysis.

- Benefit-cost analysis is simply the means by which all benefits and costs of a project are identified, measured, summed up, and compared.

- There is no set procedure for doing benefit-cost analysis because every project is different and procedures for identifying, measuring, totaling up, and comparing benefits and costs also must be different.

- There are other benefits arising from wilderness in the form of option values, benefits realized by those who do not use wilderness but receive utility from knowing it is there and available for them to use should they choose to do so. It is presently not known how to measure these option values. Therefore, they should simply be noted and not formally included in the benefit-cost calculation.

- Benefit-cost is not a technique of economic analysis but a conceptual approach using a variety of economic techniques.

- Goods and services associated with a project that are not bought and sold in the marketplace must be valued using information that is not always highly reliable. When there are benefits or costs that can be identified but not measured, the only recourse is simply to note the existence of these benefits or costs as a footnote to the analysis, recognizing that different people may place different values on these nonmeasurable benefits and costs.

- Benefit-cost does not eliminate the need for public officials to exercise subjective judgement in evaluating proposed projects, nor does it eliminate all public controversy over whether a proposed project is in the public interest.

- The effect of inflation on future prices is not figured in benefit-cost analysis. Relative prices are much more important than actual prices. If all prices are increasing as a result of inflation at about the same rate, relative prices remain more or less constant and no account need be taken of inflation. Thus, the assumption must be made that all prices on both the benefit and cost sides of the ledger will rise at a uniform rate.

- The selection of a discount rate is extremely important in the outcome of benefit-cost analysis. Discounting techniques must be used to transform all benefits and costs to present values so that valid comparisons can be made.

  Some economists argue the discount rate used in federal benefit-cost analysis should be equal to the going rate of interest. Other economists contend that the rate of return on federal investments is not directly comparable to the going rate of interest for a variety of reasons: 1) The going rate of interest reflects a before taxes rate of return in the private sector; the after taxes rate of return is somewhat less, and for private citizens in very high income tax brackets, the after taxes rate of return may be no more than half the going rate of interest; 2) The going rate of interest reflects a risk premium associated with the possibility that private sector ventures may fail and borrowers will be forced to default on their debt. There is very little risk that the federal government will default on its debt obligations; 3) The going rate of interest reflects an inflation premium based on lender expectations that the money used to repay a loan will have less purchasing power than it did at the time the money was originally loaned. If inflation is not explicitly taken into account in variation of benefits and costs in benefit-cost analysis, the discount rate should be the real, not nominal, rate of return to private investors.

- There can be no question that the performance of benefit-cost analysis is as much art as science. Nor can there be any question that the benefit-cost ratio should be the sole criterion in deciding on public investments in natural resources development.[1] Yet benefit-cost analysis does impose some discipline on decision-making relative to such public investments. When done with care and intellectual honesty, it greatly increases the amount of information available for use by decisionmakers.

Regional Acceptable Work Standards for Wilderness Management

Region Two of the Forest Service has formulated acceptable work standards for wilderness management (FSM 1310) (See Appendix D).

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[1] For the purposes of this paper the investigator has interpreted this sentence to mean that the benefit-cost ratio should not be the pole criterion in deciding on public investment.

The standards define or describe the way an activity will be done in an effort to provide uniformity in work performance and on-the-ground results of that work. Budget and management direction determine whether or not the activity should or should not be done. The guidelines do not relate to the Recreation Opportunity Spectrum, but do provide general direction for an on-the-ground stewardship level of management.

Management needs to test these standards against requirements of the wilderness law and available funding in order to determine their reasonableness.

PROCEDURES

CHAPTER 3

Chapter III

Procedures

Before one can analyze what management is buying for its wilderness dollar, the topic must be narrowed down from wilderness in general to a specific wilderness and specific budgets. Inferences for other wildernesses can then be made.

For the purpose of this paper, the Aspen Ranger District portion of the Maroon Bells-Snowmass Wilderness was selected for the following reasons:

- An interim management plan has been written which contains site specific objectives, management actions, user preferences, resource capabilities, the existing situation, and management requirements.

- From the investigator's perspective and personal knowledge, this plan would meet the objectives of the Wilderness Act and provide a means to achieve long term maintenance of the wilderness resource.

- Reliable use figures exist.

- Much social research has been done which has helped to identify the activities users desire, the social, managerial, and resource characteristics of the setting which are desirable, and the type of experience users are desiring from participating in a particular activity in a specific setting.

  In comparison to previous wilderness planning efforts, it was the opinion of the Maroon Bells-Snowmass Wilderness research team that the managers of the Maroon Bells-Snowmass Wilderness have the most comprehensive, detailed, and objective information base for wilderness management decision-making at each step of the planning process (Haas, Arnold, Brown, Driver 1982).

- Past District budgets have mostly gone towards administration of this wilderness as opposed to the other two on the District. Therefore, cost analysis will be very clean and straightforward.

- The investigator has better on-the-ground knowledge of resource conditions, use problems and recreational impacts in this wilderness.

Three alternatives will be analyzed:

1) Implementation of the interim Maroon Bells-Snowmass Wilderness plan.

2) Present management - management will continue at the 1981-1982 fiscal year levels.

3) No Action.

Wilderness condition will be analyzed by alternative. Campsite (Code-a-site) inventories were completed in 1978. However, long term change will be estimated because none of the sites have been remeasured. Some photo point comparisons will be used, but, this information is also somewhat limited.

Budget breakdowns by alternative may be found in Appendix C.

Project Area

The Maroon Bells-Snowmass Wilderness encompasses 174,000 acres of the Elk Range in central Colorado. It is located on the western slope of Colorado, approximately 150 miles west of Denver. The communities of Aspen, Snowmass, Basalt, Carbondale, Redstone, Marble, and Crested Butte surround the wilderness. It lies on the Aspen and Sopris Ranger Districts on the White River National Forest and the Taylor River District on the Grand Mesa, Uncompahgre, Gunnison National Forest.

Jagged peaks tower more than 14,000 feet above deep glacial valleys. Five peaks are over 14,000 feet in elevation.

This paper will concentrate on the Aspen Ranger District portion of the Maroon Bells-Snowmass Wilderness, which is about 95,000 acres, or about 55 percent of the total acreage.

Refer to Figure 1 for a map of the Maroon Bells-Snowmass Wilderness.

The Wilderness User

The Maroon Bells-Snowmass Wilderness is one of the most intensively used wildernesses in the Rocky Mountain Region with approximately 70,000 visitors in 1978.

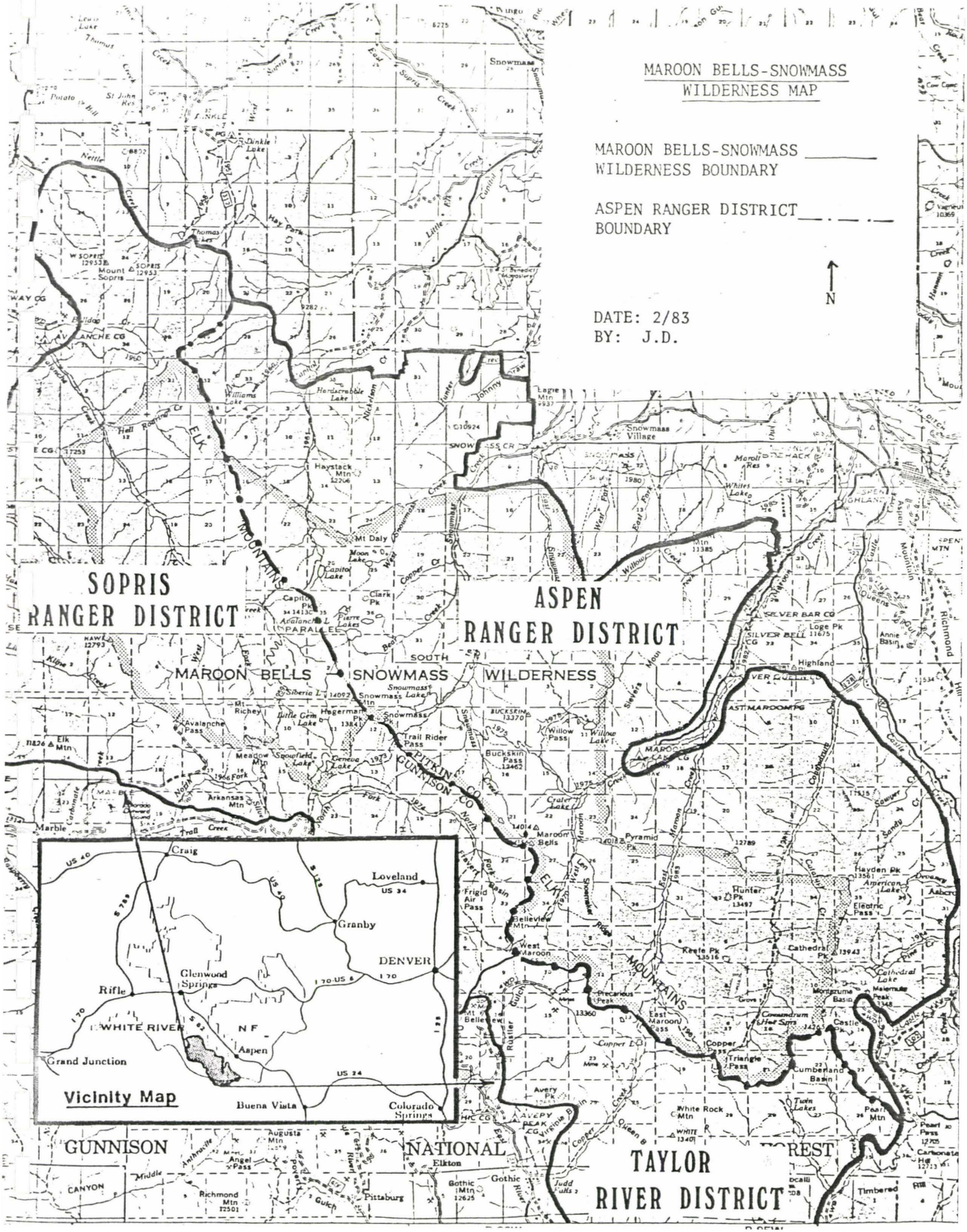
MAROON BELLS-SNOWMASS
WILDERNESS MAP
MAROON BELLS-SNOWMASS
WILDERNESS BOUNDARY
ASPEN RANGER DISTRICT
BOUNDARY
N
DATE: 2/83
BY: J.D.
SOPRIS
RANGER DISTRICT
ASPEN
RANGER DISTRICT
MAROON BELLS SNOWMASS WILDERNESS
ELK MOUNTAINS
GUNNISON NATIONAL FOREST
TAYLOR
RIVER DISTRICT
Vicinity Map
Craig
Loveland
Granby
DENVER
Glenwood Springs
Rifle
WHITE RIVER N F
Aspen
Grand Junction
Buena Vista
Colorado Springs
US 40
US 34
US 24
I 70
I 70-US 6
S 789
S 131
S 82

Table 1. Summary estimates of visitor days for the Maroon Bells-Snowmass Wilderness by seasonal time periods.

	Estimated Visitor Days	Percentage of Total Visitor Days
June 22 - September 10, 1978	53,834	77.6
September 11 - September 22, 1978	2,000	2.9
September 23 - November 20, 1978	6,987	10.1
November 21 - May 1, 1979	51	.1
May 1 - June 21, 1979	500	.7
Commercially outfitted June 22, 1978 - June 22, 1979	6,000	8.6
TOTAL	69,372	

In 1982, approximately 70,000 RVD's were recorded in the Aspen District portion of the Maroon Bells-Snowmass Wilderness.

Over half of the visitors to the Maroon Bells-Snowmass Wilderness are from outside Colorado and, of this total, nearly half are from east of the Mississippi. Over 2/3 have never been to the Maroon Bells-Snowmass Wilderness before and many are on their first wilderness visit. (Refer to Table 2.)

Table 2. Percentage of parties with previous visits to the Maroon Bells-Snowmass Wilderness within the past 12 months (6/22-9/10/78).[a]

Previous Visits Within Past 12 Months	Percentage of Parties	Estimated Number of Parties
None	68	5,480
One Visit	17	1,370
Two Visits	4	322
Three Visits	3	242
Four or More Visits	8	645

[a]Approximately 59 percent of the Maroon Bells-Snowmass Wilderness recreationists had never visited the area previously.

Because of this relative lack of sophistication on the part of many Maroon Bells-Snowmass visitors, visitor impacts are considerably greater than most wildernesses in the Rocky Mountains.

The most important activities are hiking and sightseeing. (Table 3)

Table 3. The most important activity as a reason for visiting the area by Maroon Bells-Snowmass Wilderness recreationists (6/22-9/10/78).

Activity	Percentage of Wilderness Recreationists	Estimated Number of Parties
Hiking on Trails	43	3,465
Sightseeing	19	1,531
Camping Away from Auto	9	725
Other[a]	7	564
Camping Near Auto[b]	4	322
Photography	3	242
Stream Fishing	3	242
Technical Mountain Climbing	3	242
Hiking Off Trails	2	161

[a]The primary "other" activity was relaxing.

[b]Camping near auto was chosen as the most important activity by day users of the wilderness.

Most visitors use only one or two sites per visit. (See Table 4)

Table 4. Number of overnight sites used by Maroon Bells-Snowmass Wilderness overnight recreationists (6/22-9/10/78).[a]

Overnight Sites	Percentage of Parties	Estimated Number of Parties
One Site	64	3,197
Two Sites	25	1,250
Three Sites	7	350
Four or More Sites	4	200

[a]This table only applies to Maroon Bells-Snowmass Wilderness recreation parties who indicated staying overnight.

Most of this use is located at four heavily used sites: Snowmass Lake, Avalanche Creek, Crater Lake, and Conundrum Hot Springs. For example, in 1982 there was an average of nearly 150 visitors per day at Crater Lake. Use averaged over 30 visitors per day to Snowmass Lake, with some peak use of over 100 visitors per night camped at the lake. Conundrum Hot Springs averaged 25 people per night, with peaks of nearly 60 people on most weekends.

A summary of 1978 use in heavily impacted areas is shown in Appendix E.

Existing Resource Condition

As support for the Maroon Bells-Snowmass Wilderness planning effort, an inventory of existing campsites was undertaken using the Code-a-site methodology (Hendee, Clark, Hogans, Wood, and Koch 1976). Approximately 90 campsites were inventoried during the 1978 summer season.

One element of this inventory method includes assessing the impact of previous use by observing physical characteristics of the site. These classifications are shown below with the corresponding relationship to Frissell condition class (Frissell 1978).

Code-a-Site Impact of Previous Use	Description	Corresponding Frissell Class
Extreme Impact	All previous ground vegetation gone; many roots exposed. Erosion beginning --further deterioriation will continue even without use. Impact of site has spread to surrounding area. Soil is compacted and restricts new vegetation.	4-5
Heavy Impact	Substantial impact but no continuing deterioration without use. Site would rehabilitate if not used. Most ground vegetation gone. Some roots exposed. Visual impact generally restricted to the site area. Visible trails radiate from the site. No permanent erosion.	3-4
Moderate Impact	Some denuded spots in the ground cover but vegetation is relatively intact. No exposed roots and impact is limited to the immediate site.	2-3
Light Impact	Ground vegetation completely intact. Natural processes at the site may be somewhat retarded by use.	1-2

This 1978 inventory showed the following distribution by impacts of previous use:

Category	# Sites	Percent of Total
E	3	3
H	51	59
M	28	32
L	5	6
	87	100

No significant change in condition of these campsites is believed to have occurred since 1978. This observation is based on the investigator's knowledge of the area since no detailed code-a-site reinventory has been made.

The following pictures represent typical use and show some downward trend at this particular location. Other photo points are available, but cannot be analyzed due to lack of current pictures.

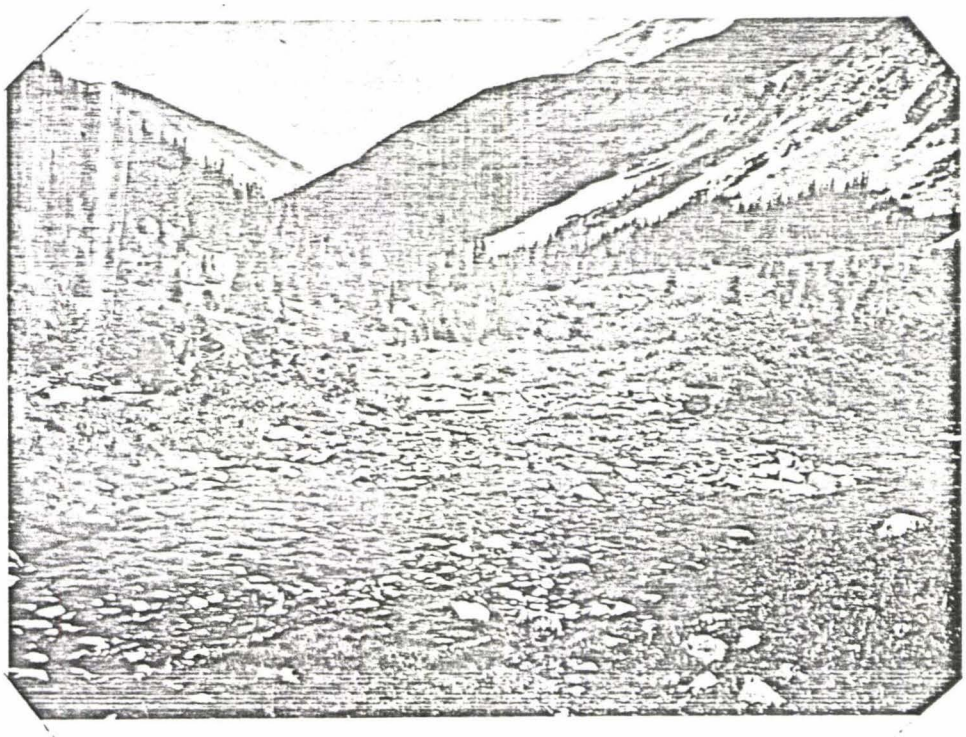

Photo #1 - Conundrum Hot Springs
Photo pt. #4, 1967

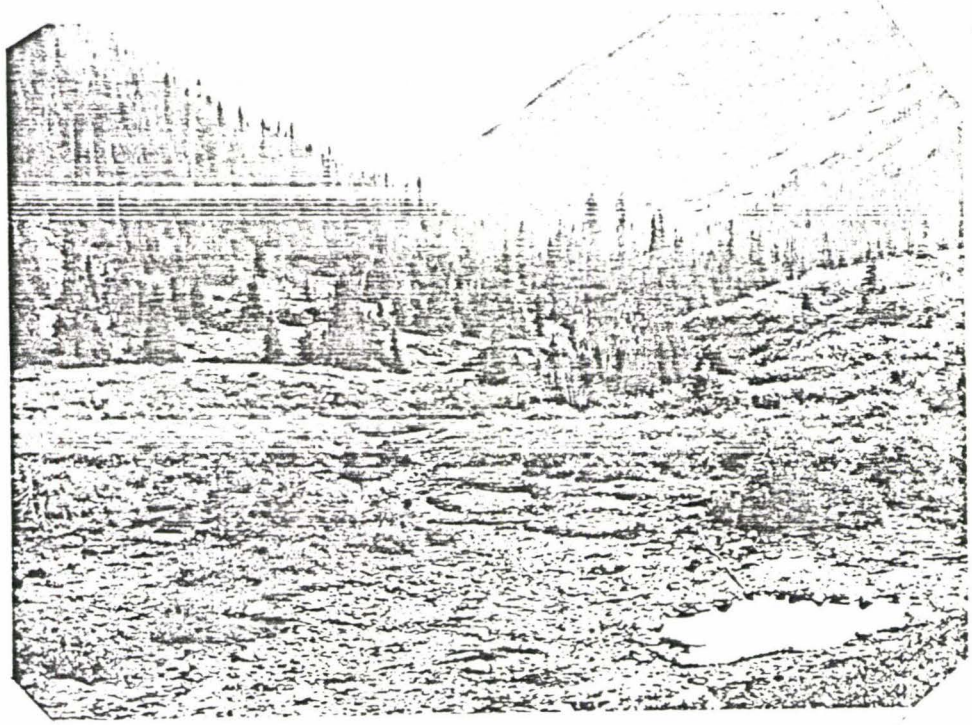

Photo #2 - Conundrum Hot Springs
Photo pt. #4, 1982

Budget Situations:

Budgets have drastically decreased over the past three fiscal years.

Fiscal Year	Aspen District[2] Wilderness Budget	Seasonal Employees		Expenditures	
		Paid	Volunteers	$/RVD	$/Ac.
1981	$28,000	6	2	.41	.29
1982	$20,000	2	6	.28	.21
1983	$13,475	1	5	.19	.14

So far, due to increased use of volunteers, the base level of wilderness guard coverage has been maintained. However, the prospects for 1983 look dismal.

This level of staffing falls far short of that needed to implement the Maroon Bells-Snowmass Wilderness Plan.

Past Management:

Past management has been concentrated on wilderness guard coverage at heavy use areas (i.e. Snowmass Creek, Snowmass Lake, Conundrum Hot Springs, and Crater Lake). Main objectives have been visitor contact, garbage and litter control, user dispersal away from lakes and streams, and fire-ring removal.

Only recently (since 1982) has more emphasis been placed on trailhead information, trail work, and site inventory.

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[2] These are actual budgets which do not recognize the value gained from use of volunteers.

Benefit-Cost Analysis:

For the purposes of this paper, each alternative (outlined on page 17) will be analyzed according to the following benefit-cost information:

Benefits:

Amount of annual use: Alternatives 1 and 3 - 70,000 RVD's [3]
Alternative 2 - 80,500 RVD's

Value of Wilderness RVD: $11.11/RVD

Costs: Refer to Appendix C

Costs will be figured by alternative. Costs will include only Forest Service administration costs. Costs of opportunities foregone, wilderness establishment costs, and wilderness plan development costs will not be considered. Examples of opportunity costs foregone include 1) increases in nonwilderness management costs as productivity on nonwilderness sites is increased to meet commodity constraints, and, 2) increases in values of products and services given up as a consequence of increasing wilderness size.

Discounting:

A simple comparison of benefits vs. costs which ignores the "time value of money" would be completely inappropriate for the analysis of projects which involve large time lags. The value of benefits received in future periods must be discounted in order to have a single standard of comparison (Brown and Dane 1974).

For the purposes of this paper, the forest plan discount rate of four percent and a 50 year time line will be used in each alternative.

Social and resource benefits and costs will be described in words. No monetary values will be assigned and they will not be included in the benefit-cost analysis calculation.

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[3] In Alternative three, use would increase, then drop as wilderness conditions deteriorate to the extent the wilderness is no longer desirable to visit. The exact extent of this change in use is impossible to predict accurately. Therefore, benefit-cost analysis in this paper will assume use will stay at approximately 70,000 RVD's.

ANALYSIS OF DATA

CHAPTER 4

Chapter IV

Analysis of Data

The approach of this paper deals with showing by example and literature search what management buys for its wilderness dollar. By analyzing the following alternatives, management at all levels should be able to determine in more specific terms what is gained or lost at various program levels. The analysis could also be used by other wilderness managers by inserting data specific to their situation.

Alternative #1 - Implementation of the interim Maroon Bells-Snowmass Wilderness Plan.

This alternative would maintain approximately the present level of visitor use. It reduces visitor use at popular destinations by redistributing overnight use into nearby areas. A permit system would be provided for if other means of maintaining acceptable level of use, based on land capability, cannot be accomplished.

This alternative provides for administrative coverage requiring approximately 10 wilderness rangers, three information specialists, and one five-person trail crew.

Frissell class condition at most sites would be maintained at current levels. Remote areas would be either enhanced or unaffected. Long term maintenance of wilderness resource value would be attained.

Cost of the alternative would be approximately $83,743 per year. Benefit-cost for this alternative would be 9.28. (See Appendix C and F for cost breakdown and benefit-cost analysis.)

Alternative #2 - Present Management.

Management would continue at the same level as the past three fiscal years. Wilderness biophysical and social elements would be allowed to degrade below current conditions. Use would be allowed to increase 10 - 15 percent. Unavoidable affects include local degradation of air and water, a reduction in opportunities for solitude, and lack of long term monitoring of the wilderness resource. The majority of these impacts will occur around popular campsites and trails. Remote areas will be allowed to become more accessible and conflicts will increase between different types of wilderness users.

Areas impacted by man's activities would increase. Therefore, areas available for scientific study purposes would decrease.

Effective administration of increased numbers of people while still successfully protecting wilderness resources and benefits are unlikely.

Frissell class condition at most sites would deteriorate further. The wilderness resource would deteriorate over the long term.

Cost of this alternative would be approximately $26,930/year. Benefit-cost for the alternative would be 35.27. (See Appendix C and F for cost breakdown and benefit-cost analysis.)

Alternative #3 - No Action.

Regional acceptable work standards cannot be met. Per FSM 1310, "if the Acceptable Work Standard cannot be met, the activity will not be performed".

Wilderness biophysical and social elements would be degraded past current conditions to the point that inherent natural succession processes would be permanently disrupted in specific heavily used travel corridors and popular destination areas.

Administration costs would not increase. However, long term costs as a result of no mitigation actions would be markedly higher than for the other alternatives.

Most popular use areas such as Snowmass Lake, Crater Lake, Geneva Lake, Conundrum Hot Springs, and principal valley bottom travel corridors would experience loss of vegetation cover, proliferation of campsite and fire-rings, and loss of organic soil loss resulting in irretrievable loss of an untrammelled biophysical environment. This loss, coupled with high density use would cause a significant degradation of the social elements of the wilderness resource.

The cost of the alternative would be $12,600. Benefit-cost of this alternative would be 61.72. (See Appendix C and F for cost breakdown and benefit-cost analysis.)

Summary

A baseline minimum program lies somewhere between alternative one and two but closer to Alternative one than two. Alternative one insures that the wilderness resource, over the long term, will be maintained.

Benefit-cost ratios are favorable enough that more funding than alternative one could be justified. More emphasis needs to be placed on long term monitoring. Otherwise, the slower degradation will not be identified until it is too late.

In the Maroon Bells-Snowmass Wilderness the point has been reached in several areas where use limitation is needed.

SUMMARY AND CONCLUSION

CHAPTER 5

Chapter V
Summary and Conclusion

Introduction

Federal wilderness managers are being faced with increasing challenges related to proper management of wilderness. Wilderness Budgets are decreasing and wilderness use is increasing. As the additional wilderness land base levels off, the importance of managing the finally established system will increase.

Therefore, management needs to better define and communicate funding needed for a baseline program for wilderness administration which meets minimum legal obligations and which recognizes long term changes in the wilderness resource.

Summary of Procedures and Findings

This paper determined by example and literature search the effectiveness of wilderness funding and how it affects physical and social resource conditions and incrementally affects the base-line program in the Maroon Bells-Snowmass Wilderness.

Specific analysis of various budgets and their effects were limited to the Aspen Ranger District and its portion of the Maroon Bells-Snowmass Wilderness.

It was found that to meet the basic requirements of the Wilderness Act and to redeem long term responsibilities of maintaining the wilderness resource, budgets must be more substantial than present. In addition to social and physical resource benefits gained, it was found that benefit-cost analysis is favorable towards funding wilderness programs appropriately in all alternatives. While alternative three has the best benefit-cost analysis ratio it is the worst alternative when non-quantifiable resource and social losses are considered.

Conclusion

Based upon the findings and within the limitations of this study the following can be concluded:

1. Current budget levels (Alternative 3) will not provide for long term maintenance of the Maroon Bells-Snowmass Wilderness resource. They are barely sufficient to pick up garbage.

2. A baseline program for the Aspen District portion of the Maroon Bells-Snowmass Wilderness is best identified by Alternative #1.

3. Baseline programs for individual wildernesses need to be determined and should include establishment and analysis of physical and social resource objectives.

4. Benefit-cost analysis for wilderness is not a particularly meaningful tool.

Discussion and Implications

Without adequate monitoring of physical and social resource conditions, it is very difficult to establish baseline programs and determine long term wilderness resource degradation. A monitoring program must allow the manager to anticipate deteriorating social and physical conditions plus allow time to correct them before they fall below standards. Existing budgets, Alternative 2 and 3, will not allow for such monitoring.

Each wilderness is different in its capability to absorb recreation use and still be "untrammelled" by man. This is complicated by the effects of management. The harm caused by numbers of users in many cases can be alleviated or changed by what the manager is willing, able, or allowed to do. Rather than focusing on numbers of users, it seems better to concentrate on the underlying conditions desired, and to take corrective action with appropriate budgets.

By law, managers are supposed to manage wilderness in such a manner as to leave it unimpaired for future use and to preserve the wilderness character. Alternatives two and three won't meet this legal obligation.

While the area affected by recreation is generally a small percentage of the total wilderness acreage, impacts tend to be concentrated in the more critical areas such as riparian zones.

At $1.18/RVD the Forest Service could operate close to a positive benefit-cost ratio. One could conclude that with little effort the wilderness program could be funded by the user. How this could be implemented would require much more study plus congressional authorization.

Recommendations

As a result of the research done on this paper, the following recommendations are made:

- Dispersion of visitors needs to be well analyzed prior to implementing because:

    1. Recreation opportunity spectrum is narrowed as dispersion becomes effective.

2. Resource and social impacts are spread over a larger area.

3. Managerial efforts are required over larger areas.

- Prior to futher dispersing use within or between wildernesses, managers must identify levels of acceptable change so they consciously know the affect their decision may have on the wilderness resource.

- In addition, thresholds of unacceptable social and biological conditions need to be defined on a wilderness by wilderness basis because of the diversity of units in the wilderness system, i.e., Pacific Northwest rainforests probably have more capacity to absorb both social and physical impacts than does a desert environment.

- Implementation of systems to measure resource conditions over the long term needs to occur now.

- Monitoring social and physical wilderness conditions should be a high priority management activity. A method needs to be determined that will stabilize long term budgets to maintain long term wilderness monitoring systems.

- Additional research is needed to:

1. Better quantify effects of various levels of use on both resource and social conditions.

2. Better define levels of acceptable impacts.

3. Refine monitoring systems to identify low cost, easily replicated measurements, much like range and timber management programs.

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APPENDIX

CHAPTER 6

APPENDIX

A. WILDERNESS ACT

B. FRISSEL CAMPSITE CONDITION CHART

C. BUDGET BREAKDOWNS BY ALTERNATIVE

D. REGIONAL ACCEPTABLE WORKSTANDARDS

E. MAROON BELLS-SNOWMASS WILDERNESS HEAVY USE IMPACT AREAS

F. BENEFIT-COST ANALYSIS

Appendix A — The Wilderness Act

Public Law 88-577
88th Congress, S. 4
September 3, 1964

AN ACT

To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Wilderness Act.

SHORT TITLE

SECTION 1. This Act may be cited as the "Wilderness Act".

WILDERNESS SYSTEM ESTABLISHED STATEMENT OF POLICY

Sec. 2. (a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(b) The inclusion of an area in the National Wilderness Preservation System notwithstanding, the area shall continue to be managed by the Department and agency having jurisdiction thereover immediately before its inclusion in the National Wilderness Preservation System unless otherwise provided by Act of Congress. No appropriation shall be available for the payment of expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit nor shall any appropriations be available for additional personnel stated as being required solely for the purpose of managing or administering areas solely because they are included within the National Wilderness Preservation System.

78 STAT. 890.
78 STAT. 891.

DEFINITION OF WILDERNESS

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

NATIONAL WILDERNESS PRESERVATION SYSTEM—EXTENT OF SYSTEM

Sec. 3. (a) All areas within the national forests classified at least 30 days before the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "wilderness", "wild", or "canoe" are hereby designated as wilderness areas. The Secretary of Agriculture shall—

(1) Within one year after the effective date of this Act, file a map and legal description of each wilderness area with the Interior and Insular Affairs Committees of the United States Senate and the House of Representatives, and such descriptions shall have the same force and effect as if included in this Act: *Provided, however*, That correction of clerical and typographical errors in such legal descriptions and maps may be made.

(2) Maintain, available to the public, records pertaining to said wilderness areas, including maps and legal descriptions, copies of regulations governing them, copies of public notices of, and reports submitted to Congress regarding pending additions, eliminations, or modifications. Maps, legal descriptions, and regulations pertaining to wilderness areas within their respective jurisdictions also shall be available to the public in the offices of regional foresters, national forest supervisors, and forest rangers.

Classification.

(b) The Secretary of Agriculture shall, within ten years after the enactment of this Act, review, as to its suitability or nonsuitability for preservation as wilderness, each area in the national forests classified on the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "primitive" and report his findings to the President. The President shall advise the United States Senate and House of Representatives of his recommendations with respect to the designation as "wilderness" or other reclassification of each area on which review has been completed, together with maps and a definition of boundaries. Such advice shall be given with respect to not less than one-third of all the areas now classified as "primitive" within three years after the enactment of this Act, not less than two-thirds within seven years after the enactment of this Act, and the remaining areas within ten years after the enactment of this Act. Each recommendation of the President for designation as "wilderness" shall become effective only if so provided by an Act of Congress. Areas classified as "primitive" on the effective date of this Act shall continue to be administered under the rules and regulations affecting such areas on the effective date of this Act until Congress has determined otherwise. Any such area may be increased in size by the President at the time he submits his recommendations to the Congress by not more than five thousand acres with no more than one thousand two hundred and eighty acres of such increase in any one compact unit; if it is proposed to increase the size of any such area by more than five thousand acres or by more than one thousand two hundred and eighty acres in any one compact unit the increase in size shall not become effective until acted upon by Congress. Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value. Notwithstanding any other provisions of this Act, the Secretary of Agriculture may complete his review and delete such area as may be necessary, but not to exceed seven thousand acres, from the southern tip of the Gore Range-Eagles Nest Primitive Area, Colorado, if the Secretary determines that such action is in the public interest.

Presidential recommendation to Congress.

Congressional approval.

78 STAT. 891.
78 STAT. 892

(c) Within ten years after the effective date of this Act the Secretary of the Interior shall review every roadless area of five thousand contiguous acres or more in the national parks, monuments and other units of the national park system and every such area of, and every roadless island within, the national wildlife refuges and game ranges, under his jurisdiction on the effective date of this Act and shall report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness. The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendation with respect to the designation as wilderness of each such area or island on which review has been completed, together with a map thereof and a definition of its boundaries. Such advice shall be given with respect to not less than one-third of the areas and islands to be reviewed under this subsection within three years after enactment of this Act, not less than two-thirds within seven years of enactment of this Act, and the remainder within ten years of enactment of this Act. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress. Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the Secretary of the Interior with respect to the maintenance of roadless areas within units of the national park system.

Report to President.

Presidential recommendation to Congress.

Congressional approval.

(d)(1) The Secretary of Agriculture and the Secretary of the Interior shall, prior to submitting any recommendations to the President with respect to the suitability of any area for preservation as wilderness—

Suitability.

(A) give such public notice of the proposed action as they deem appropriate, including publication in the Federal Register and in a newspaper having general circulation in the area or areas in the vicinity of the affected land;

Publication in Federal Register.

(B) hold a public hearing or hearings at a location or locations convenient to the area affected. The hearings shall be announced through such means as the respective Secretaries involved deem appropriate, including notices in the Federal Register and in newspapers of general circulation in the

Hearings.

Publication in Federal Register.

area: *Provided*, That if the lands involved are located in more than one State, at least one hearing shall be held in each State in which a portion of the land lies;

78 STAT. 892.
78 STAT. 893.

(C) at least thirty days before the date of a hearing advise the Governor of each State and the governing board of each county, or in Alaska the borough, in which the lands are located, and Federal departments and agencies concerned, and invite such officials and Federal agencies to submit their views on the proposed action at the hearing or by no later than thirty days following the date of the hearing.

(2) Any views submitted to the appropriate Secretary under the provisions of (1) of this subsection with respect to any area shall be included with any recommendations to the President and to Congress with respect to such area.

Proposed modification.

(e) Any modification or adjustment of boundaries of any wilderness area shall be recommended by the appropriate Secretary after public notice of such proposal and public hearing or hearings as provided in subsection (d) of this section. The proposed modification or adjustment shall then be recommended with map and description thereof to the President. The President shall advise the United States Senate and the House of Representatives of his recommendations with respect to such modification or adjustment and such recommendations shall become effective only in the same manner as provided for in subsections (b) and (c) of this section.

USE OF WILDERNESS AREAS

Sec. 4. (a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and—

16 USC 475.
16 USC 528-531.

(1) Nothing in this Act shall be deemed to be in interference with the purpose for which national forests are established as set forth in the Act of June 4, 1897 (30 Stat. 11), and the Multiple-Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215).

16 USC 577-577b.

16 USC 577c-577h.
16 USC 577d-1, 577g-1, 577h.

(2) Nothing in this Act shall modify the restrictions and provisions of the Shipstead-Nolan Act (Public Law 539, Seventy-first Congress, July 10, 1930; 46 Stat. 1020), the Thye-Blatnik Act (Public Law 733, Eighteith Congress, June 22, 1948; 62 Stat. 568), and the Humphrey-Thye-Blatnik-Andersen Act (Public Law 607, Eighty-fourth Congress, June 22, 1956; 70 Stat. 326), as applying to the Superior National Forest or the regulations of the Secretary of Agriculture.

(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq.); section 3(2) of the Federal Power Act (16 U.S.C. 796(2)); and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461 et seq.).

39 Stat. 535.
16 USC 1 *et seq.*

41 Stat. 1063.
49 Stat. 838.

(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

78 STAT. 893.
78 STAT. 894.

PROHIBITION OF CERTAIN USES

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

SPECIAL PROVISIONS.

(d) The following special provisions are hereby made:

(1) Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be necessary in the control of fire, insects and diseases, subject to such conditions as the Secretary deems desirable.

(2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the Geological Survey and the Bureau of Mines to determine the mineral values, if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

Mineral leases, claims, etc.

(3) Notwithstanding any other provisions of this Act, until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the same extent as applicable prior to the effective date of this Act, extend to those national forest lands designated by this Act as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, waterlines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and, in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this Act as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this Act: *Provided*, That, unless hereafter specifically authorized, no patent within wilderness areas designated by this Act shall issue after December 31, 1983, except for the valid claims existing on or before December 31, 1983. Mining claims located after the effective date of this Act within the boundaries of wilderness areas designated by this Act shall create no rights in excess of those rights which may be patented under the provisions of this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this Act shall contain such reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1, 1984, the minerals in lands designated by this Act as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

78 STAT. 894.
78 STAT. 895.

Water resources.

(4) Within wilderness areas in the national forests designated by the Act, (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and (2) the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

(5) Other provisions of this Act to the contrary notwithstanding, the management of the Boundary Waters Canoe Area, formerly designated as the Superior, Little Indian Sioux, and Caribou Roadless Areas, in the Superior National Forest, Minnesota, shall be in accordance with regulations established by the Secretary of Agriculture in accordance with the general purpose of maintaining, without unnecessary restrictions on other uses, including that of timber, the primitive character of the area, particularly in the vicinity of lakes, streams, and portages: *Provided*, That nothing in this Act shall preclude the continuance within the area of any already established use of motorboats.

(6) Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.

78 STAT. 895.
78 STAT. 896.

(7) Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(8) Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.

STATE AND PRIVATE LANDS WITHIN WILDERNESS AREAS

SEC. 5. (a) In any case where State-owned or privately owned land is completely surrounded by national forest lands within areas designated by this Act as wilderness, such State or private owner shall be given such rights as may be necessary to assure adequate access to such State-owned or privately owned land by such State or private owner and their successors in interest, or the State-owned land or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value under authorities available to the Secretary of Agriculture: *Provided, however*, That the United States shall not transfer to a State or private owner any mineral interests unless the State or private owner relinquishes or causes to be relinquished to the United States the mineral interest in the surrounded land.

Transfers, restriction.

78 STAT. 896.

(b) In any case where valid mining claims or other valid occupancies are wholly within a designated national forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

Acquisition.

(c) Subject to the appropriation of funds by Congress, the Secretary of Agriculture is authorized to acquire privately owned land within the perimeter of any area designated by this Act as wilderness if (1) the owner concurs in such acquisition or (2) the acquisition is specifically authorized by Congress.

GIFTS, BEQUESTS, AND CONTRIBUTIONS

SEC. 6. (a) The Secretary of Agriculture may accept gifts or bequests of land within wilderness areas designated by this Act for preservation as wilderness. The Secretary of Agriculture may also accept gifts or bequests of land adjacent to wilderness areas designated by this Act for preservation as wilderness if he has given sixty days advance notice thereof to the President of the Senate and the Speaker of the House of Representatives. Land accepted by the Secretary of Agriculture under this section shall become part of the wilderness area involved. Regulations with regard to any such land may be in accordance with such agreements, consistent with the policy of this Act, as are made at the time of such gift, or such conditions, consistent with such policy, as may be included in, and accepted with, such bequest.

(b) The Secretary of Agriculture or the Secretary of the Interior is authorized to accept private contributions and gifts to be used to further the purposes of this Act.

ANNUAL REPORTS

SEC. 7. At the opening of each session of Congress, the Secretaries of Agriculture and Interior shall jointly report to the President for transmission to Congress on the status of the wilderness system, including a list and descriptions of the areas in the system, regulations in effect, and other pertinent information, together with any recommendations they may care to make.

Approved September 3, 1964.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 1538 accompanying H. R. 9070 (Comm. on Interior & Insular Affairs) and No. 1829 (Comm. of Conference).

SENATE REPORT No. 109 (Comm. on Interior & Insular Affairs).

CONGRESSIONAL RECORD:

Vol. 109 (1963):	Apr. 4, 8,	considered in Senate.
	Apr. 9,	considered and passed Senate.
Vol. 110 (1964):	July 28,	considered in House.
	July 30,	considered and passed House, amended, in lieu of H. R. 9070.
	Aug. 20,	House and Senate agreed to conference report.

APPENDIX B - FRISSELL CLASS

CAMPSITE CONDITION CHART

Table 1. Campsite condition classes and possible management actions.

Condition class	Visible indicators	Management
1	Ground vegetation flattened but not permanently injured. Minimal physical change except for possibly a simple rock fireplace.	These sites are barely recognizable as camping areas. If not in situations known to be sensitive to use (e.g., wet or slump areas), no management action is necessary. Maintain current use level or allow increase if nearby sites must be closed.
2	Ground vegetation worn away around fireplace or center of activity.	Site change now apparent but still within acceptable limits. These areas are readily identified as campsites and will continue to attract use. Future use should be carefully monitored to detect adverse change.
3	Ground vegetation lost on most of the site, but humus and litter still present in all but a few areas.	This is a transitional condition. Considerable change in plant cover is evident but little sign of soil problems. The condition may be accepted as normal in areas of high attraction. However, modification of current use patterns and intensities may be needed to prevent further change.
4	Bare mineral soil widespread. Tree roots exposed on the surface.	Deterioration is accelerating. If current level and type of use continues, soil erosion, loss of tree cover, and esthetic degradation are likely. Withdraw use from these sites and allow recovery. Some artificial rehabilitation may be desirable to speed recovery. If site is improperly located, permanent closure should be considered. If site is reopened, insure that use patterns are adjusted to prevent reinjury.
5	Soil erosion obvious. Trees reduced in vigor or dead.	Natural recovery will be extremely slow. The sites should be closed permanently and alternate ones located. If the site is critical to the recreation pattern, extensive rehabilitation will be required to return it to acceptable condition.

APPENDIX C - WILDERNESS ADMINISTRATION COSTS
Budget Breakdowns by Alternative

Alternative #1 - Implementation of the Maroon Bells-Snowmass Wilderness Plan.

Program Management: GS-11 =	$ 7,500
1 Permanent Full Time Wilderness Coordinator	
GS-7 @ $75/day x 260 days =	$19,500
6 Wilderness Rangers	
GS-5 @ $56/day x 94 days =	$ 5,264
GS-4 @ $50/day x 65 days x 5 =	$16,250
3 Wilderness Information Specialists	
GS-4 @ $50/day x 65 days x 3 =	$ 9,750
3 Person Trail Crew	
GS-5 @ $56/day x 94 days =	$ 5,264
GS-4 @ $50/day x 65 days x 2 =	$ 6,500
SUBTOTAL	$70,028
+5% to cover holiday pay, annual leave, Sunday Differential =	$ 3,501
TOTAL SALARY COSTS[4]	$73,529
Travel Costs (Per Diem)	
11 weeks x $36/week x 9 (Wilderness Rangers & Trail Crew)	$ 3,564
Uniform Costs	
Estimated New Allowance and Replacement Allowance for 12 employees	$ 750
TOTAL PERSONNEL COST	$77,843
Equipment and Supplies	
Tools, signs, backpacking equipment, etc.	Est. $ 2,500
Vehicle(s)	
Estimated FOR	$ 1,500
Estimated Mileage	$ 1,900
TOTAL ANNUAL OPERATING COST: 1.20 $/RVD, .88 $/Acre	$83,743

[4] All Salaries in FY 1983 Planning Rates

Alternative #2 - Present Management

Program Management: GS-11 =	$ 1,100
GS-7 @ $75/day x 50 days =	$ 3,750
GS-5 @ $56/day x 80 days =	$ 4,480
GS-4 @ $50/day x 60 days x 4 =	$12,000
TOTAL SALARY COSTS[4]	$21,330
Travel Costs (Per Diem) Includes per diem for 2 volunteers plus salaried employees.[5]	$ 3,100
Uniform Costs (includes volunteers)	$ 500
Equipment and Supplies	$ 800
Vehicle Usage	$ 1,200
TOTAL COSTS: .33 $/RVD, .28 $/acre,	$26,930

Alternative #3 - No Action

1) Program Management: GS-11 [4]	$ 8,500
Travel Costs (Per Diem) Includes per diem for 4 volunteers plus salaried employees[5]	$ 3,100
Vehicle Usage	$ 1,000
TOTAL COSTS: .18 $/RVD .13 $/acre	$12,600

It is unreasonable to assume nothing will occur in the wilderness under Alternative #3, No Action. The program manager will still need to monitor conditions and situations plus complete administrative reports, etc. It is reasonable to assume the GS-11 program manager will have enough time to supervise four volunteer employees to act as his "eyes and ears" in the wilderness.

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[4] All salaries in FY83 Planning Rates.

[5] VOLUNTEER BENEFITS - Although the economic analysis in this paper only considers the cost of volunteers, it should be recognized that volunteers accrue some value also. Depending upon how a volunteer is used the value can vary from less than $8.00 per day to over $50.00 per day.

The volunteer act states that volunteers should not displace federal employees. Federal employees would be displaced in alternatives #2 and #3, but not in alternative #1.

FOREST SERVICE MANUAL
Denver, Colorado

INTERIM DIRECTIVE NO. 1 July 22, 1982

DURATION: One year from issuance date unless previously terminated or reissued

CHAPTER: 1310 - METHODS OF DOING BUSINESS

POSTING NOTICE: This is the first R-2 ID to FSM 1300

This Interim Directive on Regional Acceptable Work Standards (Exhibit 1) is issued for immediate implementation. It replaces Interim Directive No. 2 in FSM 1900 - PLANNING, issued September 8, 1981.

All Regional Acceptable Work Standards are below existing Forest Service Directive System standards. Existing Forest Service Directive System standards in many cases are not achievable at current funding levels. As a result, units are setting their own standards. This has resulted in a lack of performance uniformity among units, which in turn has made a shambles of program formulation. Unit costs are not based on uniform standards. Some functions are being performed above or below the standard depending on the unit supervisor's preference. As a result, unit costs for similar or like activities show wide variation. These standards affect approximately 40 percent of our Regional budget.

These Regional Acceptable Work Standards are not intended to repeat all the existing activities or work standards included in the Directive System. However, they are modifications of existing standards to match funding levels. Where Regional Acceptable Work Standards are not established, use existing Manual standards.

These standards do not represent a job list, but will be used in the planning and implementation of activities. If an activity is performed, it will be done to the Acceptable Work Standard. If the Acceptable Work Standard cannot be met, the activity will not be performed.

By using the Regional Acceptable Work Standards, adjustments in budgets among units may be necessary to improve uniformity throughout the Region in on-the-ground results.

S/Hanks

for CRAIG W. RUPP
Regional Forester

WILDERNESS

REGIONAL ACCEPTABLE WORK STANDARD

Activity Description and Standard	MIII Code No.	MIII Code Unit of Measure
OPERATIONS	385 391	Acres
1. Collect visitor use information to achieve a reliability level 4 (RIM FSH 2309.11).		
2. Provide and maintain only those signs which are needed to protect the wilderness resource.		
3. Sites and trails will be kept free of obvious litter.		
4. Manage sites in Frissel Condition Classes 1, 2, or 3.		
5. Close and/or rehabilitate sites in Frissell Condition Classes 4 and 5.		

Exhibit 1 - Continued

Estimated number of parties, number of people, average length of stay (hours), total recreation hours, and visitor days for each zone in the Maroon Bells-Snowmass Wilderness (6/22-9/10/78).

Wilderness Zone (Area)	Number of Parties	Number of People[a]	Average Length of Stay (Hours)	Total Hours	Visitor Days
Avalanche Creek (W1)	800	2,672	30	80,160	6,680
Capitol Lake (W2)	750	2,505	30	80,160	6,680
Snowmass Creek (W3)	3,000	10,020	17	170,340	14,195
Snowmass Lake (W4)	1,600	5,344	20	106,880	8,907
Willow Lake (W5)	300	1,002	15	15,030	1,253
Crater Lake (W6)	5,800	19,372	4	77,488	6,457
West Maroon (W7)	650	2,171	16	34,736	2,895
East Maroon (W8)	350	1,169	8	9,352	780
Conundrum (W9)	600	2,004	35	70,140	5,845
TOTALS				644,296	53,692[b]

[a]Number of people was calculated by multiplying 3.34 (average size of wilderness parties) by the number of parties for each zone.

[b]Rounding off of estimates and the use of averages as multipliers account for the deviation between this visitor day estimate and the original estimate.

Appendix F - Benefit Cost Analysis

Benefit-Cost analysis for the three alternatives was done utilizing MTVEST - A Computor Program to Evaluate Froestry Investment Opportunities.

For analysis purposes refer to the following tables for a summary of each alternative:

		Benefits	Costs	RVD's	Discount Rates	Planning Period	B/C
Analysis A	Alternative 1	$11.11/RVD	83,743	70,000	4%, 5%, 7.13%, 10%	50 years	9.28
	Alternative 2	$11.11/RVD	26,930	80,500	4%, 5%, 7.13%, 10%	50 years	35.27
	Alternative 3	$11.11/RVD	12,600	70,000	4%, 5%, 7.13%, 10%	50 years	61.72
Analysis B	Alternative 1	3.00/RVD	83,743	70,000	4%, 5%, 7.13%, 10%	50 years	2.51
	Alternative 2	3.00/RVD	26,930	80,500	4%, 5%, 7.13%, 10%	50 years	9.52
	Alternative 3	3.00/RVD	12,660	70,000	4%, 5%, 7.13%, 10%	50 years	16.67
Analysis C	Alternative 1	.50/RVD	83,743	70,000	4%, 5%, 7.13%, 10%	50 years	.42
	Alternative 2	.50/RVD	26,930	80,500	4%, 5%, 7.13%, 10%	50 years	1.59
	Alternative 3	.50/RVD	12,600	70,000	4%, 5%, 7.13%, 10%	50 years	2.78

```
@DATA, IL 215JLU*DNP.
DATA 9R1 SL74T9 02/22/83 14:37:55 (->1)
     1.        1WHITE RIVER NATIONAL FOREST
     2.        2ASPEN RANGER DISTRICT
     3.        3DENNIS E BSCHOR
     4.        4  1    1 $11.11/RVD ANALYSIS
     5.        5OPT LEVEL $11.11/RVD ALT 1     4.00  7.13  4.00    .00
     6.        6  1    WILDERNESS MANAGEMENT COST 2    1   50    .00      1.00      1.00-     83773.00
     7.        6  2    WILDERNESS BENEFITS        2    1   50    .00      1.00 70000.00          11.11
     8.        4  2    1 $11.11/RVD ANALYSIS
     9.        5RED LEVEL $11.11/RVD ALT 2     4.00  7.13  4.00    .00
    10.        6  1    WILDERNESS MANAGEMENT COST 2    1   50    .00      1.00      1.00-     26930.00
    11.        6  2    WILDERNESS BENEFITS        2    1   50    .00      1.00 85500.00          11.11
    12.        4  3    1 $11.11/RVD ANALYSIS
    13.        5MIN LEVEL $11.11/RVD ALT 3     4.00  7.13  4.00    .00
    14.        6  1    WILDERNESS MANAGEMENT COST 2    1   50    .00      1.00      1.00-     12600.00
    15.        6  2    WILDERNESS BENEFITS        2    1   50    .00      1.00 70000.00          11.11
END DATA.  ERRORS:  NONE.  TIME:   0.517 SEC.  IMAGE COUNT:  15

@USE 9.,215JLU*DNP.

@ASG,T TEMP1.

@USE 10.,TEMP1.

@XQT R01PPB*MTVEST.F4
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----MTVEST----
A COMPUTER PROGRAM
TO EVALUATE FORESTRY
INVESTMENT OPPORTUNITIES

FORESTRY ORGANIZATION - WHITE RIVER NATIONAL FOREST
ORGANIZATION SUBDIVISION - ASPEN RANGER DISTRICT
ANALYST - DENNIS E BSCHOR

****
*PROJECT OR PROGRAM - $11.11/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - OPT LEVEL $11.11/RVD ALT 1 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-83773.00	-1799627.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	777700.00	.00	16706697.25
						TOTALS =	-1799627.30	16706697.25

+++++++++++++++++++++++++++++++++++++
+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
+++++++++++++++++++++++++++++++++++++

	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	9.28	9.28	9.28	9.28	9.28
PRESENT NET WORTH	14907070.00	14907070.00	12668280.25	9421561.87	6880157.87
ANNUAL EQUIVALENT VALUE OF PNW	693926.99	693926.99	693927.00	693926.98	693926.98
LAND EXPECTATION VALUES --LEV1	17348178.25	17348178.25	13878540.62	9732496.37	6939270.37
--LEV2	17348178.25	17348178.25	13878540.62	9732496.37	6939270.37

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

NOTE: - PNW AND IRR ARE BASED ON ONE PLANNING PERIOD,
**** INCLUDING INFLATION AND VALUE INCREASES.
- LEV1 AND IRR1 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS,
INFLATION AND VALUE INCREASES CONTINUING BEYOND FIRST PLANNING PERIOD.
- LEV2 AND IRR2 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS,
INFLATION AND VALUE INCREASES STOPPING AFTER FIRST PLANNING PERIOD.

****
*PROJECT OR PROGRAM - $11.11/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - RED LEVEL $11.11/RVD ALT 2 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEG. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-26930.00	-578515.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	949905.00	.00	20406037.25
						TOTALS =	-578515.30	20406037.25

++++++++++++++++++++++++++++++++++++
+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
++++++++++++++++++++++++++++++++++++

	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	35.27	35.27	35.27	35.27	35.27
PRESENT NET WORTH	19827522.00	19827522.00	16849763.50	12531384.62	9151126.37
ANNUAL EQUIVALENT VALUE OF PNW	922974.98	922974.98	922974.98	922974.99	922974.98
LAND EXPECTATION VALUES --LEV1	23074379.25	23074379.25	18459500.50	12944950.87	9229750.37
--LEV2	23074379.25	23074379.25	18459500.50	12944950.87	9229750.37

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

*PROJECT OR PROGRAM - $11.11/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - MIN LEVEL $11.11/RVD ALT 3 *

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-12600.00	-270675.56	.00
2	WILDERNESS BENEFITS	2	1	50	.00	777700.00	.00	16706697.25
						TOTALS =	-270675.56	16706697.25

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+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
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	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	61.72	61.72	61.72	61.72	61.72
PRESENT NET WORTH	16436021.75	16436021.75	13967609.25	10387889.50	7585825.00
ANNUAL EQUIVALENT VALUE OF PNW	765099.99	765099.99	765100.00	765099.98	765099.98
LAND EXPECTATION VALUES --LEV1	19127503.50	19127503.50	15302000.62	10730715.12	7651000.37
--LEV2	19127503.50	19127503.50	15302000.62	10730715.12	7651000.37

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

ORDERING OF PROJECTS OR PROGRAMS BASED ON RESPECTIVE RANKING RATES

PROBLEM TITLE	RANKING RATE
OPT LEVEL $11.11/RVD ALT 1	4.00%
RED LEVEL $11.11/RVD ALT 2	4.00%
MIN LEVEL $11.11/RVD ALT 3	4.00%

PROJECTS RANKED BY PRESENT NET WORTH

PROBLEM TITLE	PNW
OPT LEVEL $11.11/RVD ALT 1	14907070.00
MIN LEVEL $11.11/RVD ALT 3	16436021.75
RED LEVEL $11.11/RVD ALT 2	19827522.00

PROJECTS RANKED BY BENEFIT-COST RATIO

PROBLEM TITLE	B/C
OPT LEVEL $11.11/RVD ALT 1	9.28
RED LEVEL $11.11/RVD ALT 2	35.27
MIN LEVEL $11.11/RVD ALT 3	61.72

PROJECTS RANKED BY ANNUAL EQUIVALENT VALUE

PROBLEM TITLE	AEV
OPT LEVEL $11.11/RVD ALT 1	693926.99
MIN LEVEL $11.11/RVD ALT 3	765099.99
RED LEVEL $11.11/RVD ALT 2	922974.98

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR
OPT LEVEL $11.11/RVD ALT 1	>100.00
RED LEVEL $11.11/RVD ALT 2	>100.00
MIN LEVEL $11.11/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR1
OPT LEVEL $11.11/RVD ALT 1	>100.00
RED LEVEL $11.11/RVD ALT 2	>100.00
MIN LEVEL $11.11/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR2
OPT LEVEL $11.11/RVD ALT 1	>100.00
RED LEVEL $11.11/RVD ALT 2	>100.00
MIN LEVEL $11.11/RVD ALT 3	>100.00

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV1
OPT LEVEL $11.11/RVD ALT 1	17348178.25
MIN LEVEL $11.11/RVD ALT 3	19127503.50
RED LEVEL $11.11/RVD ALT 2	23074379.25

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV2
OPT LEVEL $11.11/RVD ALT 1	17348178.25
MIN LEVEL $11.11/RVD ALT 3	19127503.50
RED LEVEL $11.11/RVD ALT 2	23074379.25

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+ MARGINAL ANALYSIS SUMMARY +
+ BASED ON RESPECTIVE RANKING RATES +
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PROBLEM TITLE	RANKING RATE	$ DISCOUNTED COST	$ DISCOUNTED BENEFIT	MARGINAL CHANGES COST	MARGINAL CHANGES BENEFIT	MARGINAL B/C RATIO
MIN LEVEL $11.11/RVD ALT 3	4.00%	270675.56	16706697.25			
RED LEVEL $11.11/RVD ALT 2	4.00%	578515.30	20406037.25	307839.74	3699340.00	12.02
OPT LEVEL $11.11/RVD ALT 1	4.00%	1799627.30	16706697.25	1221112.00	-3699340.00	-3.03

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@DELETE,C DNP.
FURPUR 28R2 U1 S74T11 02/22/83 14:38:03
@FREE,D      215JLU*DNP(1)
CSF$ STATUS 600000000000

@ASG,UP 215JLU*DNP.
FAC WARNING        100000000000
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@DATA, IL 215JLU*DNP.
DATA 9R1 SL74T9 02/22/83 14:38:12 (->1)
     1.       1WHITE RIVER NATIONAL FOREST
     2.       2ASPEN RANGER DISTRICT
     3.       3DENNIS E BSCHOR
     4.       4  1   1 $3.00/RVD ANALYSIS
     5.       5OPT LEVEL $3.00/RVD ALT 1     4.00  7.13  4.00   .00
     6.       6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00     1.00-    83773.00
     7.       6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 70000.00         3.00
     8.       4  2   1 $3.00/RVD ANALYSIS
     9.       5RED LEVEL $3.00/RVD ALT 2     4.00  7.13  4.00   .00
    10.       6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00     1.00-    26930.00
    11.       6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 85500.00         3.00
    12.       4  3   1 $3.00/RVD ANALYSIS
    13.       5MIN LEVEL $3.00/RVD ALT 3     4.00  7.13  4.00   .00
    14.       6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00     1.00-    12600.00
    15.       6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 70000.00         3.00
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@ASG,T TEMP1.
FAC WARNING        100000000000

@USE 10.,TEMP1.

@XQT R01PPB*MTVEST.F4
```

----MTVEST----
A COMPUTER PROGRAM
TO EVALUATE FORESTRY
INVESTMENT OPPORTUNITIES

FORESTRY ORGANIZATION - WHITE RIVER NATIONAL FOREST
ORGANIZATION SUBDIVISION - ASPEN RANGER DISTRICT
ANALYST - DENNIS E BSCHOR

****
*PROJECT OR PROGRAM - $3.00/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - OPT LEVEL $3.00/RVD ALT 1 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-83773.00	-1799627.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	210000.00	.00	4511259.31
						TOTALS =	-1799627.30	4511259.31

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+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
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	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	2.51	2.51	2.51	2.51	2.51
PRESENT NET WORTH	2711632.06	2711632.06	2304390.81	1713804.91	1251517.34
ANNUAL EQUIVALENT VALUE OF PNW	126226.99	126226.99	126227.00	126227.00	126227.00
LAND EXPECTATION VALUES --LEV1	3155675.50	3155675.50	2524540.12	1770364.66	1262270.06
--LEV2	3155675.50	3155675.50	2524540.12	1770364.66	1262270.06

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

NOTE: **** - PNW AND IRR ARE BASED ON ONE PLANNING PERIOD, INCLUDING INFLATION AND VALUE INCREASES.
- LEV1 AND IRR1 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS, INFLATION AND VALUE INCREASES CONTINUING BEYOND FIRST PLANNING PERIOD.
- LEV2 AND IRR2 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS, INFLATION AND VALUE INCREASES STOPPING AFTER FIRST PLANNING PERIOD.

*PROJECT OR PROGRAM -- $3.00/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - RED LEVEL $3.00/RVD ALT 2 *

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-26930.00	-578515.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	256500.00	.00	5510181.00
						TOTALS =	-578515.30	5510181.00

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+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
++++++++++++++++++++++++++++++++++++

	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	9.52	9.52	9.52	9.52	9.52
PRESENT NET WORTH	4931665.75	4931665.75	4191013.06	3116909.97	2276144.06
ANNUAL EQUIVALENT VALUE OF PNW	229569.99	229569.99	229570.00	229570.00	229569.99
LAND EXPECTATION VALUES --LEV1	5739251.00	5739251.00	4591400.25	3219775.56	2295700.09
--LEV2	5739251.00	5739251.00	4591400.25	3219775.56	2295700.09

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

****
*PROJECT OR PROGRAM - $3.00/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - MIN LEVEL $3.00/RVD ALT 3 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-12600.00	-270675.56	.00
2	WILDERNESS BENEFITS	2	1	50	.00	210000.00	.00	4511259.31
						TOTALS =	-270675.56	4511259.31

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+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
+++++++++++++++++++++++++++++++++++++

			DISCOUNT RATES		
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	16.67	16.67	16.67	16.67	16.67
PRESENT NET WORTH	4240583.75	4240583.75	3603719.87	2680132.53	1957184.48
ANNUAL EQUIVALENT VALUE OF PNW	197399.99	197399.99	197400.00	197400.00	197400.00
LAND EXPECTATION VALUES --LEV1	4935000.87	4935000.87	3948000.19	2768583.44	1974000.09
--LEV2	4935000.87	4935000.87	3948000.19	2768583.44	1974000.09

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

ORDERING OF PROJECTS OR PROGRAMS BASED ON RESPECTIVE RANKING RATES

PROBLEM TITLE	RANKING RATE
OPT LEVEL $3.00/RVD ALT 1	4.00%
RED LEVEL $3.00/RVD ALT 2	4.00%
MIN LEVEL $3.00/RVD ALT 3	4.00%

PROJECTS RANKED BY PRESENT NET WORTH

PROBLEM TITLE	PNW
OPT LEVEL $3.00/RVD ALT 1	2711632.06
MIN LEVEL $3.00/RVD ALT 3	4240583.75
RED LEVEL $3.00/RVD ALT 2	4931665.75

PROJECTS RANKED BY BENEFIT-COST RATIO

PROBLEM TITLE	B/C
OPT LEVEL $3.00/RVD ALT 1	2.51
RED LEVEL $3.00/RVD ALT 2	9.52
MIN LEVEL $3.00/RVD ALT 3	16.67

PROJECTS RANKED BY ANNUAL EQUIVALENT VALUE

PROBLEM TITLE	AEV
OPT LEVEL $3.00/RVD ALT 1	126226.99
MIN LEVEL $3.00/RVD ALT 3	197399.99
RED LEVEL $3.00/RVD ALT 2	229569.99

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR
OPT LEVEL $3.00/RVD ALT 1	>100.00
RED LEVEL $3.00/RVD ALT 2	>100.00
MIN LEVEL $3.00/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR1
OPT LEVEL $3.00/RVD ALT 1	>100.00
RED LEVEL $3.00/RVD ALT 2	>100.00
MIN LEVEL $3.00/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR2
OPT LEVEL $3.00/RVD ALT 1	>100.00
RED LEVEL $3.00/RVD ALT 2	>100.00
MIN LEVEL $3.00/RVD ALT 3	>100.00

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV1
OPT LEVEL $3.00/RVD ALT 1	3155675.50
MIN LEVEL $3.00/RVD ALT 3	4935000.87
RED LEVEL $3.00/RVD ALT 2	5739251.00

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV2
OPT LEVEL $3.00/RVD ALT 1	3155675.50
MIN LEVEL $3.00/RVD ALT 3	4935000.87
RED LEVEL $3.00/RVD ALT 2	5739251.00

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+ MARGINAL ANALYSIS SUMMARY +
+ BASED ON RESPECTIVE RANKING RATES +
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PROBLEM TITLE	RANKING RATE	$ DISCOUNTED COST	$ DISCOUNTED BENEFIT	MARGINAL CHANGES COST	MARGINAL CHANGES BENEFIT	MARGINAL B/C RATIO
MIN LEVEL $3.00/RVD ALT 3	4.00%	270675.56	4511259.31			
RED LEVEL $3.00/RVD ALT 2	4.00%	578515.30	5510181.00	307839.74	998921.69	3.24
OPT LEVEL $3.00/RVD ALT 1	4.00%	1799627.30	4511259.31	1221112.00	-998921.69	-.82

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@DELETE,C DNP.
FURPUR 28R2 U1 S74T11 02/22/83 14:38:23
@FREE,D      215JLU*DNP(1)
CSF$ STATUS 600000000000

@ASG,UP 215JLU*DNP.
FAC WARNING        100000000000
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@DATA,IL 215JLV*DNP.
DATA 9R1 SL74T9 02/22/83 14:38:33 (->1)
     1.        1WHITE RIVER NATIONAL FOREST
     2.        2ASPEN RANGER DISTRICT
     3.        3DENNIS E BSCHOR
     4.        4  1   1 $0.50/RVD ANALYSIS
     5.        5OPT LEVEL $0.50/RVD ALT 1      4.00  7.13  4.00   .00
     6.        6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00      1.00-    83773.00
     7.        6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 70000.00           .50
     8.        4  2   1 $0.50/RVD ANALYSIS
     9.        5RED LEVEL $0.50/RVD ALT 2      4.00  7.13  4.00   .00
    10.        6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00      1.00-    26930.00
    11.        6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 85500.00           .50
    12.        4  3   1 $0.50/RVD ANALYSIS
    13.        5MIN LEVEL $0.50/RVD ALT 3      4.00  7.13  4.00   .00
    14.        6  1   WILDERNESS MANAGEMENT COST 2   1  50   .00     1.00      1.00-    12600.00
    15.        6  2   WILDERNESS BENEFITS       2   1  50   .00     1.00 70000.00           .50
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@ASG,T TEMP1.
FAC WARNING         100000000000

@USE 10.,TEMP1.

@XQT R01PPB*MTVEST.F4
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----MTVEST----
A COMPUTER PROGRAM
TO EVALUATE FORESTRY
INVESTMENT OPPORTUNITIES

FORESTRY ORGANIZATION - WHITE RIVER NATIONAL FOREST
ORGANIZATION SUBDIVISION - ASPEN RANGER DISTRICT
ANALYST - DENNIS E BSCHOR

****
*PROJECT OR PROGRAM - $0.50/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - OPT LEVEL $0.50/RVD ALT 1 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-83773.00	-1799627.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	35000.00	.00	751876.56
						TOTALS =	-1799627.30	751876.56

+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: 00% +
+ PLANNING PERIOD: 50 YEARS +

	x	OPT1	RANK	STD	OPT	STD
		DISCOUNT RATES				
CRITERIA		4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO		.42	.42	.42	.42	.42
PRESENT NET WORTH		-1047750.73	-1047750.73	-890396.30	-662199.11	-483575.27
ANNUAL EQUIVALENT VALUE OF PNW		-48773.00	-48773.00	-48773.00	-48773.00	-48773.00
LAND EXPECTATION VALUES --LEV1		-1219325.23	-1219325.23	-975460.05	-684053.28	-487730.02
--LEV2		-1219325.23	-1219325.23	-975460.05	-684053.28	-487730.02

INTERNAL RATES OF RETURN:
IRR < .00%
IRR1 < .00%
IRR2 < .00%

NOTE: **** - PNW AND IRR ARE BASED ON ONE PLANNING PERIOD, INCLUDING INFLATION AND VALUE INCREASES.
- LEV1 AND IRR1 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS, INFLATION AND VALUE INCREASES CONTINUING BEYOND FIRST PLANNING PERIOD.
- LEV2 AND IRR2 ARE BASED ON PERPETUAL SERIES OF PLANNING PERIODS, INFLATION AND VALUE INCREASES STOPPING AFTER FIRST PLANNING PERIOD.

****
*PROJECT OR PROGRAM - $0.50/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - RED LEVEL $0.50/RVD ALT 2 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-26930.00	-578515.30	.00
2	WILDERNESS BENEFITS	2	1	50	.00	42750.00	.00	918363.52
						TOTALS =	-578515.30	918363.52

+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +

	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	1.59	1.59	1.59	1.59	1.59
PRESENT NET WORTH	339848.21	339848.21	288808.76	214790.77	156852.37
ANNUAL EQUIVALENT VALUE OF PNW	15820.00	15820.00	15820.00	15820.00	15820.00
LAND EXPECTATION VALUES --LEV1	395500.08	395500.08	316400.02	221879.38	158200.01
--LEV2	395500.08	395500.08	316400.02	221879.38	158200.01

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

****
*PROJECT OR PROGRAM - $0.50/RVD ANALYSIS *
*BASE PROBLEM OR ALTERNATIVE - MIN LEVEL $0.50/RVD ALT 3 *
****

OPT1 RATE	OPT2 RATE	RANKING RATE	INFLATN. RATE
4.00	7.13	4.00	.00

SEQ. NO.	ITEM	PAYMT TYPE	YEARS BEGIN	YEARS END	INCRD VALUE RATE	BEGINNING YEAR NONDISCOUNTED TOTAL VALUE	$ DISCOUNTED AT 4.00% COST	$ DISCOUNTED AT 4.00% BENEFIT
1	WILDERNESS MANAGEMENT COST	2	1	50	.00	-12600.00	-270675.56	.00
2	WILDERNESS BENEFITS	2	1	50	.00	35000.00	.00	751876.56
						TOTALS =	-270675.56	751876.56

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+ EVALUATION OF PROJECT OR PROGRAM +
+ INFLATION RATE: .00% +
+ PLANNING PERIOD: 50 YEARS +
++++++++++++++++++++++++++++++++++++

	DISCOUNT RATES				
	OPT1	RANK	STD	OPT	STD
CRITERIA	4.00%	4.00%	5.00%	7.13%	10.00%
BENEFIT-COST RATIO	2.78	2.78	2.78	2.78	2.78
PRESENT NET WORTH	481201.00	481201.00	408932.75	304128.51	222091.86
ANNUAL EQUIVALENT VALUE OF PNW	22400.00	22400.00	22400.00	22400.00	22400.00
LAND EXPECTATION VALUES --LEV1	560000.11	560000.11	448000.02	314165.49	224000.02
--LEV2	560000.11	560000.11	448000.02	314165.49	224000.02

INTERNAL RATES OF RETURN:
IRR > 100.00%
IRR1 > 100.00%
IRR2 > 100.00%

ORDERING OF PROJECTS OR PROGRAMS BASED ON RESPECTIVE RANKING RATES

PROBLEM TITLE	RANKING RATE
OPT LEVEL $0.50/RVD ALT 1	4.00%
RED LEVEL $0.50/RVD ALT 2	4.00%
MIN LEVEL $0.50/RVD ALT 3	4.00%

PROJECTS RANKED BY PRESENT NET WORTH

PROBLEM TITLE	PNW
OPT LEVEL $0.50/RVD ALT 1	-1047750.73
RED LEVEL $0.50/RVD ALT 2	339848.21
MIN LEVEL $0.50/RVD ALT 3	481201.00

PROJECTS RANKED BY BENEFIT-COST RATIO

PROBLEM TITLE	B/C
OPT LEVEL $0.50/RVD ALT 1	.42
RED LEVEL $0.50/RVD ALT 2	1.59
MIN LEVEL $0.50/RVD ALT 3	2.78

PROJECTS RANKED BY ANNUAL EQUIVALENT VALUE

PROBLEM TITLE	AEV
OPT LEVEL $0.50/RVD ALT 1	-48773.00
RED LEVEL $0.50/RVD ALT 2	15820.00
MIN LEVEL $0.50/RVD ALT 3	22400.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR
OPT LEVEL $0.50/RVD ALT 1	< .00
RED LEVEL $0.50/RVD ALT 2	>100.00
MIN LEVEL $0.50/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR1
OPT LEVEL $0.50/RVD ALT 1	< .00
RED LEVEL $0.50/RVD ALT 2	>100.00
MIN LEVEL $0.50/RVD ALT 3	>100.00

PROJECTS RANKED BY INTERNAL RATE OF RETURN

PROBLEM TITLE	IRR2
OPT LEVEL $0.50/RVD ALT 1	< .00
RED LEVEL $0.50/RVD ALT 2	>100.00
MIN LEVEL $0.50/RVD ALT 3	>100.00

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV1
OPT LEVEL $0.50/RVD ALT 1	-1219325.23
RED LEVEL $0.50/RVD ALT 2	395500.08
MIN LEVEL $0.50/RVD ALT 3	560000.11

PROJECTS RANKED BY LAND EXPECTATION VALUE

PROBLEM TITLE	LEV2
OPT LEVEL $0.50/RVD ALT 1	-1219325.23
RED LEVEL $0.50/RVD ALT 2	395500.08
MIN LEVEL $0.50/RVD ALT 3	560000.11

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+ MARGINAL ANALYSIS SUMMARY +
+ BASED ON RESPECTIVE RANKING RATES +
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PROBLEM TITLE	RANKING RATE	$ DISCOUNTED COST	$ DISCOUNTED BENEFIT	MARGINAL CHANGES COST	MARGINAL CHANGES BENEFIT	MARGINAL B/C RATIO
MIN LEVEL $0.50/RVD ALT 3	4.00%	270675.56	751876.56			
RED LEVEL $0.50/RVD ALT 2	4.00%	578515.30	918363.52	307839.74	166486.95	.54
OPT LEVEL $0.50/RVD ALT 1	4.00%	1799627.30	751876.56	1221112.00	-166486.95	-.14

@FIN